Technical Support DLA
Apparel Research Network
Final Report

22 May 2002

Prepared by

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(AMPTIAC)

Operated by

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14. ABSTRACT

The Defense Logistics Agency's Research and Development Enterprise Division established a network of universities, equipment suppliers, apparel manufacturers, industry consultants and software developers. The focus of this network, known as the Apparel Research Network, is to optimize the military clothing supply chain. Coordinating research activities of these diverse organizations is a daunting task. The Defense Logistics Agency's Research and Development Enterprise Division employs the DoD's Advanced Materials and Processes Technology Information Analysis Center (AMPTIAC) to directly assist the ARN program management with meeting coordination, technical oversight support, and assistance in technology transfer. This report describes the contents of that support from April 2001 to May 2002.

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Executive Summary

The Apparel Research Network is comprised of universities, equipment suppliers, apparel manufacturers, industry consultants and software developers. Coordinating research activities of these sundry organizations is a daunting task. The Defense Logistics Agency's Research and Development Enterprise Division employs the DoD's Advanced Materials and Processes Technology Information Analysis Center (AMPTIAC) to directly assist the ARN program management with meeting coordination, technical oversight support, and assistance in technology transfer. This report describes the contents of that support from April 2001 to May 2002.

In this time, AMPTIAC conducted six ARN meetings. For each meeting, AMPTIAC arranged for the necessary facilities, documented the meeting events, and recorded action items. AMPTIAC also tracked the technical progress of ARN projects, reviewed ARN technical documentation, prepared technical report summaries, and generated ARN briefing materials. Finally, AMPTIAC provided technology transfer assistance by preparing ARN descriptive materials and by maintaining the ARN web site.

1   Introduction

1.1   Background

The Defense Logistics Agency (DLA) supplies food, clothing, and spare parts to the Nation's combat forces during peacetime and emergency. The Defense Logistics Agency established the Apparel Research Network (ARN) to significantly improve the U.S. apparel industry's ability to meet DoD requirements. This network includes universities, equipment suppliers, apparel manufacturers, industry consultants and software developers. Each organization in the network is a Partner; moreover, each ARN Partner brings a specific technical expertise used to procure quality, cost effective clothing items. The Apparel Research Network focuses upon optimizing the military clothing supply chain at the retail, wholesale and manufacturing levels using a customer driven uniform manufacturing approach. By developing and applying innovative methods and advanced technologies, the ARN achieved savings totaling over $105 million. The savings result from an inventory reduction of the Army and the Marine Corps issued items at both the retail and wholesale level.

1.2   ARN Support Task

The DLA apparel program depends upon IIT Research Institute (IITRI) to provide technical support to the ARN and its constituent programs. The IITRI operated Manufacturing Technology Information Analysis Center (MTIAC) provided this support at the inception of ARN. The MTIAC Director from 1990 to 1998, Michal Safar, performed and oversaw the original support activities including literature searches to support the establishment of an apparel research knowledge base. Today, the IITRI operated Advanced Materials and Processes Technical Information Analysis Center

(AMPTIAC) assists the DLA apparel program. Ms. Safar continues to supply technical support to ARN as an AMPTIAC consultant. The following report describes the assistance provided from April 2001 to April 2002.

2   Specific Tasks:

AMPTIAC performs meeting coordination, program management support, and technology transfer to support the ARN. The following section describes these three vital roles and discusses the tasks completed throughout this program.

2.1   Coordinate ARN Project Meetings

Coordination and communication of multiple external partners is extremely challenging. This is especially true with diverse groups such as the ARN partners. AMPTIAC and Ms. Safar coordinated and conducted meetings of the Apparel Research Network. The purpose of these meetings is to define program objectives, review available apparel technologies, and to provide a forum for formal and informal interaction among ARN participants. For each meeting, AMPTIAC arranged for the necessary facilities by renting meeting rooms, computer projection equipment, phone lines, and projection screens. AMPTIAC also supplied meeting refreshments for the meeting breaks. Throughout the course of each meeting, Ms. Safar ensured a smoothly running meeting by acting as a meeting moderator, arranging working group sessions, and making sure the proper facilities and equipment is available to all ARN members. She documented all significant findings, conclusions, recommendations, and action items. The details for each of these meetings follow this section.

2.1.1 ARN Virtual Prime Vendor, 9-10 May 2001, San Diego, CA

AMPTIAC arranged meeting rooms and hotel facilities for the ARN Virtual Prime Vender (VPV) meeting held in San Diego on 9-10 May 2001. Michal Safar coordinated and attended this meeting. The agenda included an all day meeting on the 9th and a half day meeting on the 10th. On the afternoon of the 10th, the VPV researchers visited the Marine Corps Recruit Depot, San Diego to view the in-process Quality Logistics Management (QLM) implementation and the use of Mark Sense forms for recruit issue data. The meeting agenda, minutes, action items and presentations from this meeting have been posted on the ARN web site (http://arn.iitri.org/docs/vpv5-9/index.html).

2.1.2 ARN Phase II Pre-Proposal Conference, 14 June 2001, Arlington, VA

Michal Safar helped organize and conduct the ARN II Pre-proposal Conference held at the Crystal City Marriott, June 14, 2001. Approximately 20 attended. The attendance list, meeting presentations, and a transcript of the meeting can be found on the ARN web site at http://arn.iitri.org/new/index.html. Prior to the meeting, she attended a working session at AdvanTech, Inc. on June 13, 2001 to review the status of the ARN Supply-chain Transaction Repository for Action (ASTRA) program. She also supported an ARN meeting following the ARN II Pre-proposal Conference to discuss ARN Supply-chain Automated Processing (ASAP), ASTRA, and the ARN Help Desk.

2.1.3 ARN II Source Selection Meeting, 6-9 August 2001, Philadelphia, PA

Ms. Safar organized and assisted the ARN II Source Selection Meeting in Philadelphia. While in attendance, she summarized the evaluation forms and delivered them to Defense Supply Center - Philadelphia (DSCP) contracts. Due to the sensitive

nature of source selection materials, no record of this meeting is posted on the ARN web site.

2.1.4 ARN Supply Chain System Meeting, 15-16 October 2001, San Diego, CA

AMPTIAC arranged hotel facilities at the Sheraton San Diego Hotel and Marina for an ARN Supply Chain System Meeting on October 15-16, 2001. Ms. Safar coordinated and attended a meeting with the Marine Corps Recruit Depot - San Diego and ARN researchers. The agenda included working sessions on the afternoon of the 15th through the 16th with AdvanTech, Inc. (ATI), Product Data Integrated Technologies, Inc. (PDIT), Head Quarters Marine Corps (HQMC), and the MCRD-SD. The agenda, meeting minutes, action items, and presentations are posted to the ARN web site (http://arn.iitri.org/docs/notes.html).

2.1.5 Meeting at the Defense Manufacturing Conference 2001

While at the 2001 Defense Manufacturing Conference, Ms. Safar coordinated a meeting and conference call of DSCP personnel and the ARN Program Manager. Issues discussed at this meeting included ASAP, the Clemson Apparel Research (CAR) Year 7 proposal, MCRD-SD physical inventory, and 3D body scanning issues.

2.1.6 ARN II Kickoff Meeting, 13 February 2002, Philadelphia, PA

Ms. Safar organized the ARN II Kickoff Meeting in Philadelphia. While there she provided an overview of the ARN web site to the ARN Partners. The agenda, attendance list, and presentations are published on the ARN web site at http://arn.iitri.org/docs/arn2 /index.html.

2.1.7 Other Activities

In addition to the coordination of onsite meetings, AMPTIAC also facilitated numerous conference calls; both for ARN Programs and Partners. Examples include conference calls on the 3D Body Scan Technologies Program during July and August 2001. Similarly, a telephone-conference for the ARN Supply-chain Automated Processing (ASAP) took place October 2001, as well as other ASAP conference calls held with Product Data Integrated Technologies, Inc. (PDIT) in August and September 2001. Other ARN Partner conference calls include two November conference calls with Clemson Apparel Research and a December call with EDI Integration, Inc. and AdvanTech, Inc.

AMPTIAC also arranged a couple fact finding meetings at the Great Lakes Naval Training Center during June and November 2001. During the June meeting, installation of whole body 3-D scanner was discussed. In November, a review of 3-D scanner manufacturer data was discussed. The November meeting featured a tour of recruit clothing issue and food supply service activities. Other site visits included Fort Jackson, SC and Lackland AFB, Texas to review male and female clothing issues.

2.2 Provide Program Management Support

The purpose of this effort is to provide direct technical and administrative support to ARN program management. IIT Research Institute's status as a not-for-profit institution in combination with an independent consultant (Michal Safar) helps ensure unbiased support. Furthermore, the IITRI operated DoD Center (Advanced Materials and Processes Technology Information Analysis Center) contains a wealth of materials knowledge with over 205,000 materials documents. AMPTIAC enjoys access to the IITRI operated Manufacturing Technical Information Analysis Center's technical library

of over 16,000 documents, and access to the greater DoD holdings. Ms. Safar is intimately familiar with the elements of the ARN since she has been involved with ARN from the inception. These proficiencies are required to address the diverse nature of the ARN program. The type of technical and administrative support that AMPTIAC and Ms. Safar perform include: assistance in tracking the technical progress of ARN projects, reviewing ARN technical documentation, preparing technical report summaries, generating ARN briefing materials, and sustaining the apparel research knowledge base. The following section describes each of these tasks.

2.2.1 Track Technical Progress of ARN Projects

Given the multitude of ARN partners, AMPTIAC and Ms. Safar oversee tracking the technical progress of the various efforts for DLA. This function is often manifested in recording action items from meetings per the customer's direction. Establishing action items consists of assigning them a number, recording the date that they are opened, recording the original due date, recording any revised due dates and recording the status. Once the action items are established, Ms. Safar ensures that they are brought to fruition by periodically checking their status, verbally informing the ARN program manager, and posting their status on the ARN web site.

Throughout the year, Ms. Safar tracks the unresolved action items. For example, Ms. Safar worked closely with Southern Polytechnic State University to ensure that the methodology to generate a number of size selection tables was established. Ms. Safar worked with the U.S. Navy Clothing and Textile Research Facility (NCTRF) on Naval Size Selection. Ms. Safar also worked with Cyberware on action items related to the size selection software and the 3-D scanner data. Additionally, Ms Safar tracked the

implementation of a 3-D scanner at the Great Lakes Naval Training Center. Appendix A contains a more detailed look at the action items from the ARN 15-16 October 2001 meeting. Action items from other meetings are archived at the ARN web site (http://arn.iitri.org/index.html).

2.2.2 Review ARN Technical Documentation

With multiple disciplines and ARN partners, a substantial amount of technical information is generated under the ARN umbrella. For example, ARN generated over 150 interim and technical reports during the period of this task. AMPTIAC provides direct technical support to the ARN program management by reviewing proposals, interim progress reports and final technical reports generated by the ARN partners.

2.2.2.1 Review Partner and Program Documents

Under this task, AMPTIAC supplies ARN program management with an unbiased external outlook. In 2002 DLA began a new consortium of ARN contractors. Ms. Safar supported this transition starting with a review of the Broad Agency Announcement documents (BAA). Ms. Safar continued to help throughout the awards process by reviewing the DSCP contract award justification and cost share guidelines. In addition Ms. Safar helped review the Clemson Apparel Research Year 7 technical proposal and the AdvanTech, Inc. Smartcard/Issue Integration proposals. Other contributions include reviewing all 3D body scanning notes and proposals for Great Lakes Naval Training Center and Marine Corps Recruit Depot, Parris Island; reviewing the Supply Chain Defense Technology Objective for TARA; reviewing ARN procedures; reviewing ARN Business Systems Modernization data requirements; and reviewing the Joint Planning Committee Charter.

2.2.2.2 Review ARN Contractor Status Reports

Technology documentation plays a crucial role in the successful transition of technologies. Reporting helps extend technical transition outside the DoD into other agencies and even the commercial sector. In addition, ensuring current reporting obligations are met preserves a legacy for future efforts to build upon. In other words, we won't need to reinvent the wheel.

Keeping current with just the reporting requirements for all ARN efforts is a laborious task. To assist in this undertaking, AMPTIAC generated status reports on the progress of ARN deliverables each month. In addition, summary reports on special interest items such as tours of recruit clothing issue at both Lackland Air Force Base and the Great Lakes Naval Training Center were prepared. Ms. Safar also generated the ARN acronym list posted on the ARN web site (http://arn.iitri.org/acronym/acronym.pdf). The ARN Acronym List can be found in Appendix B.

The task of reviewing all technical reports generated under ARN is equally important and equally daunting. Numerous reviews of ongoing interim and final technical reports across the ARN Spectrum were performed. Table I shows a snapshot of the Interim Reports reviewed periodically throughout the course of this task.

Table I: Interim Reporting Reviews

Contractor	3-D Scanning	Supply Chain Management	Demo
Clemson Apparel Research			X
Cyberware	X		
Southern Polytechnic State University	X		
EDI Integration Corp.		X	
Product Data Integration Technologies, Inc.		X	
California Polytechnic University			X

Final technical reports reviewed in the course of this program include the following:

- Cyberware Delivery Order 9
- Clemson Apparel Research Year 4 & 5
- California Polytechnic University Year 4 & 5
- Logistics Management Institute - 3D Scanner Baselining:
  o Part 1 - Operational Baseline
  o Part 2 - Update on Scanner Processing Times
  o Part 3 - Summary, Conclusions, Simulations, Economic Analysis
- Southern Tech - Size Selection, Delivery Order 2
- Product Data Integration Technologies, Inc. Delivery Orders 4-5

Above and beyond the ARN interim and final reporting reviews, special contractor reports such as the Logistics Management Institute's Great Lakes clothing issue report or the Clemson Apparel Research Bobbin Article and Task presentation were reviewed.

2.2.3   Generate ARN Briefing Materials

The Apparel Research Network is an extremely successful, highly visible DoD program. As such, the demand to present the program results is high. AMPTIAC helped reduce this time consuming demand by preparing briefing materials. Under this task, the ARN presentation for the 2002 DoD Technology Area Review and Assessment (TARA) was prepared (see Appendix C). Ms. Safar also helped with the ARN 2003 Program Objectives Memorandum (POM) submission. A Fact Sheet was prepared to support the POM for new ManTech funding, as well as charts for the Joint Defense Manufacturing Technology Panel briefing to the House Armed Services Committee (HASC) staff. Other highlights include preparing a Portfolio Review Briefing for the ARN Advanced Manufacturing Enterprise Subpanel and preparing registration material for the Office of the Under Secretary of Defense's C3I Database for IT Initiatives.

In addition to the generation of external briefing material, materials were prepared to facilitate new ARN programs. This support consisted of helping develop the BAA schedule, question list and cost share guidelines. Support for the new ARN programs continued at the Pre-Proposal Conference with the generation of PowerPoint slides and an accompanying transcript. For the ARN II kickoff meeting Ms. Safar prepared and presented the ARN web site briefing (Appendix D), prepared the contracting presentation, and prepared partner handouts.

2.2.4 Sustain Apparel Research Knowledge Base

In order to avoid "reinventing the wheel" AMPTIAC helps ARN remain abreast of the latest innovations in the apparel realm through periodic literature surveys. AMPTIAC performed monthly literature searches of 3-D scanning technologies, reviewed the search results, ordered the appropriate documents and disseminated the results. As an outgrowth of this effort, Ms. Safar assembled and provided information on foot scanners to the Great Lakes Naval Training Center. AMPTIAC also performed literature searches on other ARN interest items for DLA program management such as providing research on the Sytronics Corporation and using budget cost work schedules to track programs. AMPTIAC also collected information and generated briefings, fact sheets, and reports to answer a number of DLA data calls on an as-needed basis.

In addition to collecting apparel knowledge, AMPTIAC used this warehouse of apparel knowledge to answer inquiries submitted through the ARN web site. For instance, Ms. Safar examined Tecmath's 2-D scanner technology and case studies.

2.3 Conduct and Assist in ARN Technology Transfer

Technology transfer is critical to a program like ARN where ideas need to progress to fruition quickly. AMPTIAC provides technology transfer assistance by preparation of ARN descriptive materials and by maintaining the ARN web site.

2.3.1 Coordinate and Prepare ARN Descriptive Materials

AMPTIAC and Ms. Safar coordinated and prepared ARN descriptive materials such as success stories, brochures, and presentations. Copies of these promotional materials are maintained on the ARN web site. AMPTIAC helped collect information, storyboard, write, and revise the Defense Logistics Agency Technical Enterprise Division (J339) brochure. In particular, the following pages to the DLA Boucher were developed:

- Did You Know Page
- DLA and Its R&D Components Programs Page
- Apparel Research Page
- Combat Rations Network (CORANET) Page
- Electronics Availability Page
- Casting Forging Page
- Industrial Plant Equipment Page

Information about ARN activities was disseminated by developing an ARN brochure and graphics. These materials were used to operate an exhibit booth at the 2001 Defense Manufacturing Conference (DMC). AMPTIAC also created several SIGACTS (significant acts) on the ARN Supply Chain Program, the ARN tutorial at DSCP, and the DMC conference, in addition to, a couple of WARs (Weekly Activity Reports) for DLA on the 3-D Navy scanner efforts and the ARN II Broad Agency Announcement. Other contributions to technical transition include preparation of a Hammer award chart for the Advanced Manufacturing Enterprise briefing, preparation of a DLA J33 Smart Book Fact Sheet, and a presentation for the American Apparel and Footwear Association conference.

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2.3.2 Maintain and Populate the ARN Web Site

The ARN web site (http://arn.iitri.org/) offers the ARN partners a centralized archive of apparel research knowledge. Moreover, the ARN site allows new users to become familiar with apparel research in the DoD. The ARN web site is heavily used both by ARN partners and new users. Due to the heavy usage, the site can be a powerful tool for transitioning technology. AMPTIAC generates web statistics each month which highlight the popularity of the web site. The following table from the April 2002 ARN web statistics shows over 50,000 pages on the ARN site from nearly 5,000 visitors. The activity shown in Table II is representative of a typical month.

Table II: Web Site Activity

Statistics - Report Range: 04/01/2002 00:00:00 - 04/30/2002 23:59:59		
Hits	Entire Site (Successful)	99,703
	Average Per Day	3,323
	Home Page	30,752
Page Views	Page Views (Impressions)	54,711
	Average Per Day	1,823
	Document Views	54,680
Visitor Sessions	Visitor Sessions	7,958
	Average Per Day	265
	Average Visitor Session Length	00:42:35
	International Visitor Sessions	9.53%
	Visitor Sessions of Unknown Origin	34.63%
	Visitor Sessions from United States	55.83%
Visitors	Unique Visitors	4,752
	Visitors Who Visited Once	4,083
	Visitors Who Visited More Than Once	669

Web site maintenance for the ARN site consists of posting new technical documents, posting working documents, updating the ARN calendar, updating web page links, updating rosters; and generating the web statistics, and maintaining and populating the ARN web site. Physical maintenance consists of hosting ARN on a secure server with firewall and daily access protection. The server performs virus scans weekly with virus signature tables updated daily. Additionally, the server is protected in a locked building with guards to escort any visitors and has four levels of physical security

including 24 hour 7 days a week intrusion detection with motion detectors, closed circuit cameras, and glass breakage sensors.

The ARN web site is also a large web site consisting of thousands of web pages. General maintenance consists of ensuring that all links to apparel sites, ARN member sites, and DoD sites are current. This task is performed weekly. In addition, updates to the current contact information of the ARN members in an "ARN People Locator" section of the site (http://arn.iitri.org/roster/index.html) were conducted. This People Locator consists of the attendance lists for each workshop, contacts at DLA, other government points of contact, ARN Partners, ARN program support, and Supply Chain Management. The People Locator is updated as needed.

The ARN web site is most instrumental in transitioning technology via dissemination of technical documents including final technical reports, interim reports, and presentations are posted frequently. The ARN web site also provides a platform which allows the ARN Partners to organize and track tasking via the "ARN Working Document" section (http://arn.iitri.org/docs/index.html). Working documents such as the ARN Supply-chain Transaction Repository for Action (ASTRA) Daily Status Reports are posted for ARN partner use frequently. This section of the web site also contains ARN action items, users manuals for the ARN Supply Chain Automated Processing, meeting minutes, and workshop proceedings.

3   Summary

The Apparel Research Network includes universities, equipment suppliers, apparel manufacturers, industry consultants and software developers. In order to coordinate research activities of these organizations, DLA requires support from

AMPTIAC. AMPTIAC directly supports the ARN program management with meeting coordination, technical oversight support, and assistance in technology transfer.

AMPTIAC assisted communication throughout the ARN Partnership by conducting six one-day limited focus meetings. For each meeting, AMPTIAC arranged for the necessary facilities, documented the meeting events, and recorded meeting action items. AMPTIAC and Ms. Safar provided direct technical and administrative support by assisting tracking of the technical progress of ARN projects, reviewing ARN technical documentation, preparing technical report summaries, generating ARN briefing materials, and building upon the apparel research knowledge base. AMPTIAC provided technology transfer assistance by preparing ARN descriptive materials and by maintaining the ARN web site.

4   Recommendations

As the Apparel Research Network continues to evolve and grow, this evolution and growth will be reflected in the ARN web site. Presently, the ARN web site contains thousands of documents and links. ARN, DLA, and Ms. Safar could all enjoy increased productivity if the web site grew with ARN. AMPTIAC, as the ARN caretaker of this legacy technical data, recommends that the site be modified to include search tools, a new organizational structure, and electronic tools to reduce the labor required to maintain the site.

Appendix A

ARN MEETING OCTOBER 15-16, 2001
Meeting Notes

October 15

Automating the Size Selection Tables

Mike O'Connell gave the group a summary of what was discussed at the October 9th meeting with Marshall Perrin, Christian Juhring and Carol Ring. A more detailed summary was prepared by Marshall Perrin and is attached.

The conclusion was that it is perfectly possible to create a web-based interface that will assist in the generation of size selection tables, however considerable expertise in garment design and sizing will be required to use it. Various approaches to this were discussed including rewriting the existing DigiSize software or developing a separate interface that will work with DigiSize, or both.

Action Item: PDIT will work with ATI to develop a draft approach to this project. The completion of the plan is dependent on information to be received from Paul Rosso.
Due Date: November 8, 2001

October 16

ASAP and ISP Hosting

Mike O'Connell gave an update on ASAP and identified a variety of issues to be addressed. He also presented the issues involved with using ISP hosting. These presentations are included.

Action Items

Sequel FTP: PDIT will open an SCR to complete the automation of SQL FTP to WINS. This will complete the manufacturing functions in ASAP.
Due Date: Prior to October 22, 2001

Freeze ASAP Manufacturing: PDIT will freeze the ASAP Manufacturing functions
Due Date: October 22, 2001

ASAP User Overview Document: Hardware and software requirements for system users will be added to this document.
Due Date: October 22, 2001

Data Validation: PDIT will validate data with Apparel Manufacturing.
Due Date: October 22, 2001

VIM ASAP Statistics - PDIT will prepare an outline of what needs to be included in this report and a date when it will be available on VIM.
Due Date: October 26, 2001

Implementation of ASAP at Tennessee Manufacturing: PDIT will send an email to Bernie and Diane S. asking them to contact Tennessee Manufacturing about this implementation.
Due Date: ASAP

ASAP Introduction/Training Session: Bernie Johns will look into the possibility of conducting an ASAP session in conjunction with a DFAS committee meeting in early December.
Due Date: October 27, 2001

Variances: To overcome a problem in SAMMS it was agreed that ASAP would use zero variance for all DVD contracts. All others would use the variance written in the contract. Bernie Johns will prepare a written request/authorization for this action and it will be included in the Exception Log (see below).
Due Date: October 19, 2001

Special DD250 Codes: Some non-required codes are available on the DD250. These codes are used internally by the manufacturers and are not recorded in SAMMS. These codes will not be added to ASAP. **No action required.**

Exception Log: An exception log for any ARN variances with SAMMS or other legacy systems will be developed to include the rationale for the variance and the authority for it. ATI will develop a draft of this log to detail what will be included and where it will be accessed.
Due Date: November 8, 2001

Paper DD250's: DD 250s are available from the VIM Order Completion Tracking function. It was proposed that the IMs and KOs use this function for printing DD250s rather than requiring the manufacturer to submit paper copies. PDIT will send a list of manufacturers using the DD250 to Kathy Moore. Kathy will set up a plan with Bernie to test this with the 2 Dianes.
Due Date List of Manufacturers: October 19, 2001
Due Date Test Plan: October 26, 2001

ISP Hosting: This environment is too volatile to evaluate. PDIT/ATI will develop a plan to upgrade the existing servers.
Due Date: November 8, 2001

MCRD SD Operational Concepts

Bob Padilla provided a presentation and draft operational concepts for:

- Developing and Implementing a Comprehensive Audit Capability for Issues Processed through the Scan Form System
- Investigating Smart Card Technology and the Feasibility of Transferring of Essential Information onto the Autodata Scan Form
- Incorporating Recruit Identification and Size Data from the 3D Body Scanner into the Autodata Scan Forms for Phase 2 Issues

The presentation and draft operational concepts are attached.

The Comprehensive Audit report is scheduled to be completed by the end of November. It will validate results of daily processing of scan forms and identify and research discrepancies. ATI has worked with MCRD SD to design the screens with the information needed.

There was considerable discussion about the use of Smart Card/Common Access Card Data to populate the issue scan forms and a variety of approaches were discussed. Julie offered ARN resources to assist with error checking. Charlie Lewis responded that the issue was time rather than resources. The number one consideration was not to introduce any procedures that would slow down the issue line. He suggested that MCRD SD would find it more time efficient and accurate to collect daily issue data by doing daily inventories of the issue line and eliminating the issue scan forms. He said that scanning the boxes is already done at the end of each issue day to determine how much inventory to move from bulk storage. Bernie agreed that that system would be less prone to error than the recruits filling out individual scan forms. Julie said that alternative systems will be considered, but need to be planned, tested and documented before being implemented. Any alternative system must meet the essential DSCP/ARN requirement to capture the daily issue data quantity by NSN.

There was also considerable discussion about the integration of 3D scan data into the issue data. Approaches and feasibility were discussed. MCRD SD questioned benefits of the scan data both in terms of accuracy and overall speed of the process.

Action Items

Issue Data Capture: ATI will work with MCRD SD to develop a plan to test the feasibility of capturing issue data through daily issue line inventories.
Due Date: TBD pending MCRD SD/HQMC resolution of the allocation of reserve/recruit costs.

3D Scan Data: The entire scanner operation at MCRD SD will be reevaluated.
Due Date: TBD

ASTRA Update

Carol Fraser presented an update on the status of ASTRA, and Bob Padilla presented an update on the ASTRA Report. The presentations are attached.

Action Items

Deleted DODAACS: Carol will send this list to Kathy Moore.
Due Date: October 19, 2001

ASAP ASTRA Transactions: Mike O'Connell will send ATI a list of the ASAP functions that will be going through ASTRA as well as estimated volumes for each.
Due Date: October 18, 2001

ASTRA Activity List: ATI will add a column to the table to indicate what has been validated for each transaction and what the status of incomplete transactions is.
Due Date: October 24, 2001

ASTRA Messaging: ATI will open an SCR to automatically send messages to the individual CIIPS on the status of their transactions.

ASTRA Report: ATI will open an SCR to format the ASTRA report in VIM as an exception mechanism.

Other Discussion

Army User Group Meeting: It was proposed that an Army User Group Meeting would be beneficial. Kathy Moore will work with DSCP, TRADOC and Carol Fraser to propose a plan for this, including potential dates and locations, to TRADOC.
Due Date: November 8, 2001.

DSCP Updates: In order to keep the Item Managers and contracting staff aware of what is available in VIM, Julie proposed reinstating the bi-weekly meetings at DSCP. Kathy Moore will coordinate this with DSCP.
Due Date: November 8, 2001.

CAR Proposal: ATI, PDIT and DSCP will review with CAR proposal, particularly in regard to the Outside Requirements, and submit comments to Julie.
Due Date: October 22, 2001.

Appendix B

ARN Acronyms and Glossary

AAVS	ARN Asset Visibility System	The ARN repository for all supply chain system data.
ACO	Administrative Contracting Office	Varies by contract.
ARN	Apparel Research Network	The Defense Logistics research and development program funded through the DoD Manufacturing Technology Program to make significant improvements in all segments (retail, wholesale and manufacturing) of the military clothing supply chain by developing and applying innovative methods and advanced technologies. http://arn.iitri.org
ARNScan		The ARN developed software for measurement extraction and size selection from WBX 3D scan data.
ASAP	ARN Supply-chain Automated Processing	The component of the ARN supply chain system that tracks manufacturers' inventories and handles procurement and financial transactions.
ASTRA	ARN Supply-chain Transaction Repository for Action	The component of the ARN supply chain system that validates the transactions that are sent out from the ARN supply chain system.
ATI	AdvanTech, Inc.	ARN Partner
BIFRS	Balanced Inventory Flow Replenishment System	The component of the ARN supply chain system that levels manufacturers production and balances system-wide inventories through recommended manufacturing cut quantities.
CAR	Clemson Apparel Research	ARN Partner
CIIP	Clothing Initial Issue Point	A facility, located at an Initial Entry Training site, that issues the initial clothing issue to new soldiers
CRDL	Contract Data Requirements List	ARN contracting reporting requirements.
DLA	Defense Logistics Agency	The government agency responsible for the acquisition of supplies and services so support the military services.
DMC	Defense Manufacturing Conference	Annual conference to review Manufacturing Technology Program projects and exchange perspectives on DoD manufacturing technology and sustainment initiatives. http://www.dmc2000.utcdayton.com
DSCP	Defense Supply Center Philadelphia	The lead center at DLA responsible for the acquisition of food, clothing, medical, general, and industrial supplies and services.
JDMTP	Joint Defense Manufacturing Technology Panel	Oversees the DoD Manufacturing Technology Program which is the ARN funding source in the DoD budget. http://www.dodmantech.com
LMI	Logistics Management Institute	ARN program support.
MCRD-PI	Marine Corps Recruit Depot - Parris Island	
MCRD-SD	Marine Corps Recruit Depot - San	

	Diego	
PCO	Procuring Contracting Office	See the ARN web site at http://arn.iitri.org/roster/dscp.html for the current points of contact.
PDIT	Product Data Integrated Technologies, Inc.	ARN Partner.
PM	Program Manager	See the ARN web site at http://arn.iitri.org/roster/dscp.html for information.
QLM-C	Quality Logistics Management-Central	The component of the ARN supply chain system that automates redistribution of wholesale inventories.
QLM-L	Quality Logistics Management-Local	The component of the ARN supply chain system that provides automated retail inventory management, ordering and replenishment for use at military recruit training centers. Currently implemented at the Marine Corps Recruit Depots and 6 Army Recruit Training Centers.
QLM-R	Quality Logistics Management-Retail	The retail inventory management component of the ARN supply chain system originally developed for MCRD-SD. Superceded by QLM-Local.
TARA	Technology Area Review and Assessment	Biannual review of all DoD technology programs. ARN falls under the Manufacturing Technology TARA.
VIM	Virtual Item Manager	The user interface used by DSCP Item managers and Defense Apparel Manufacturers to access the ARN supply chain system.
VPV	Virtual Prime Vendor	Several definitions. Until recently it designated supply chain management projects within the ARN program. Currently it refers to various DSCP initiatives, including the regional distribution centers.
WBX		The ARN 3D body scanner developed for use at recruit training centers. Currently in operation at MCRD-SD.

Appendix C

Joint Defense ManTech Panel

TARA

Manufacturing Technology Program

Defense Logistics Agency

Apparel Research Network (ARN)

Bernie Johns

Defense Supply Center Philadelphia

March 5, 2002

Program Manager: Julie Tsao
HQ. DLA J-339

DLA Apparel Research

TARA '98 – Identify the Scope, Methodology and Technical Approach

BEFORE & AFTER ARN
MCRD - San Diego
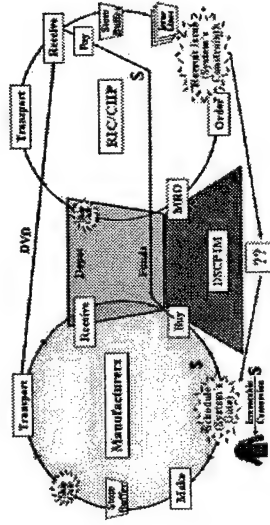
TARA '00 – Retail Achievements
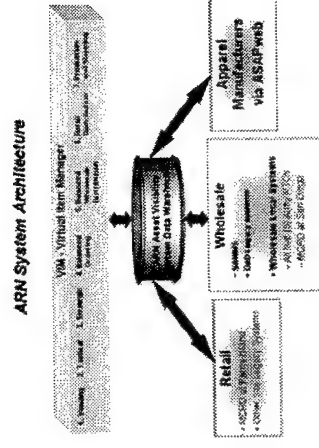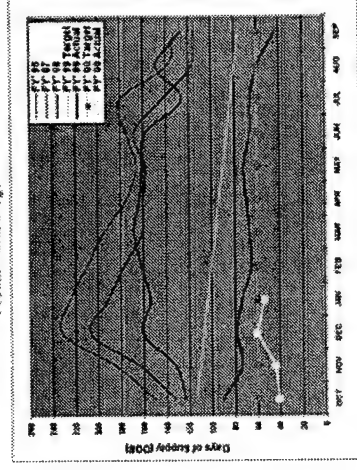
TARA '02 – Wholesale & Manufacturing

ARN System Architecture

ARN PROGRAM RATIONALE

- ## $1.25B Sales in FY 2002

- ## Business Case with Positive Present Value

Program pays for itself with positive NPV

MILLIONS OF DOLLARS

15
10
5
0
-5
-10
-15

FY95 FY96 FY97 FY98 FY99 FY00 FY01 FY02
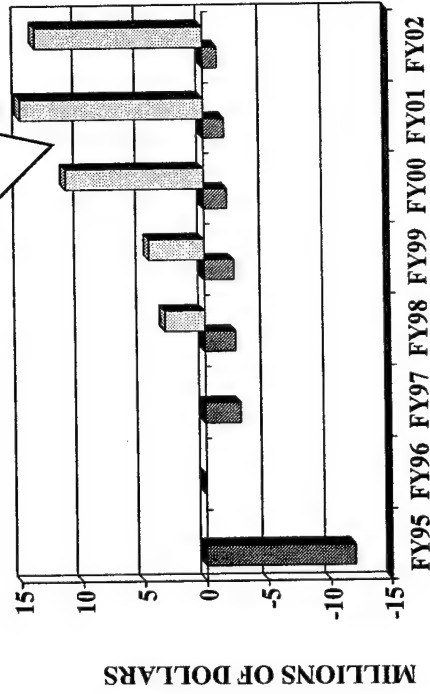
ARN Cash Flow in FY97 Dollars

DLA Apparel Research

Apparel Research Network (ARN)

FY 1987

Military Sewn Product Automation
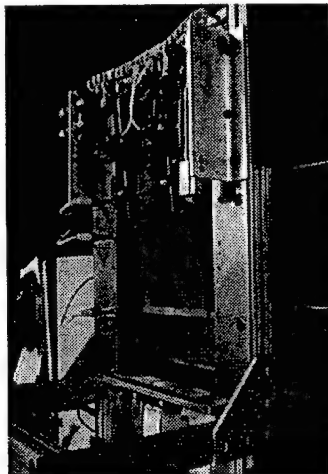
Building Technology Base

FY 1995 – Present

3D Scan for Clothing Issues at MCRD-SD

Retail Inventory Reduction:
MCRD - SD & PI $10M
US Army – all (5) RTCs $18.5M

Integrated Recruit Supply Chain System - Balanced Inventory Flow & Replenishment

Demo Sites
Special Measurement
Hard-to-Procure Items
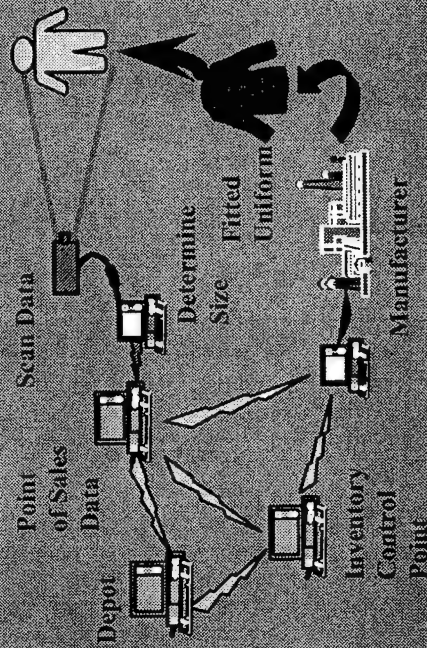
Future Vision: 3D scan data file & ARN Supply Chain System for immediate troop deployment support

Scan Data

Point of Sales Data

Depot

Inventory Control Point

Determine Size

Fitted Uniform

Manufacturer

Our Vision

Right Item, Right Time
Right Place, Right Price
Every Time, Best Value Solutions
For America's Warfighters

ONE TEAM, ONE FOCUS
AROUND THE CLOCK AROUND THE WORLD
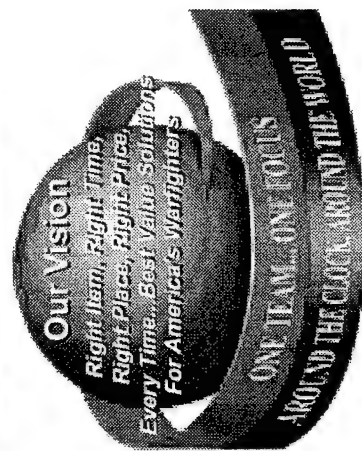
Employment Levels in Textile & Apparel Industries

	90	91	92	93	94	95	96	97	98	99	2000
Apparel	1036	1006	1007	989	969	916	868	824	763	692	650
Textiles	691	670	674	675	673	663	627	616	598	560	541

Thousands of Employees
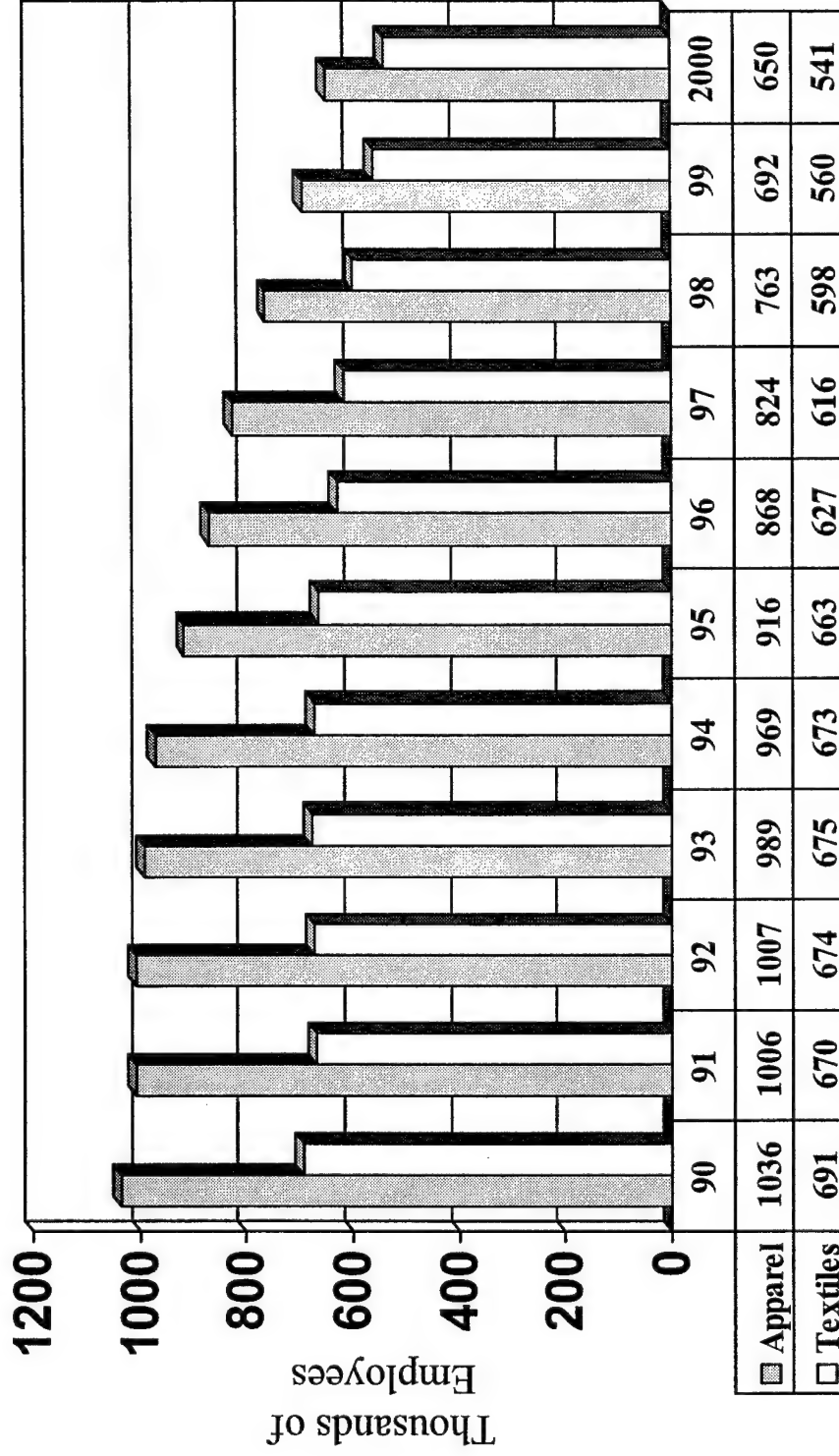
Source: The American Apparel and Footwear Association

Textile & Apparel Imports

	90	91	92	93	94	95	96	97	98	99	2000
▨ Apparel	6	6.2	7	7.8	8.6	9.2	9.8	11.6	13	14.1	16
☐ Textiles	6.2	6.6	7.5	8.2	8.8	9	9.4	11.8	12.8	14.5	16.8

Billions of Square Meters
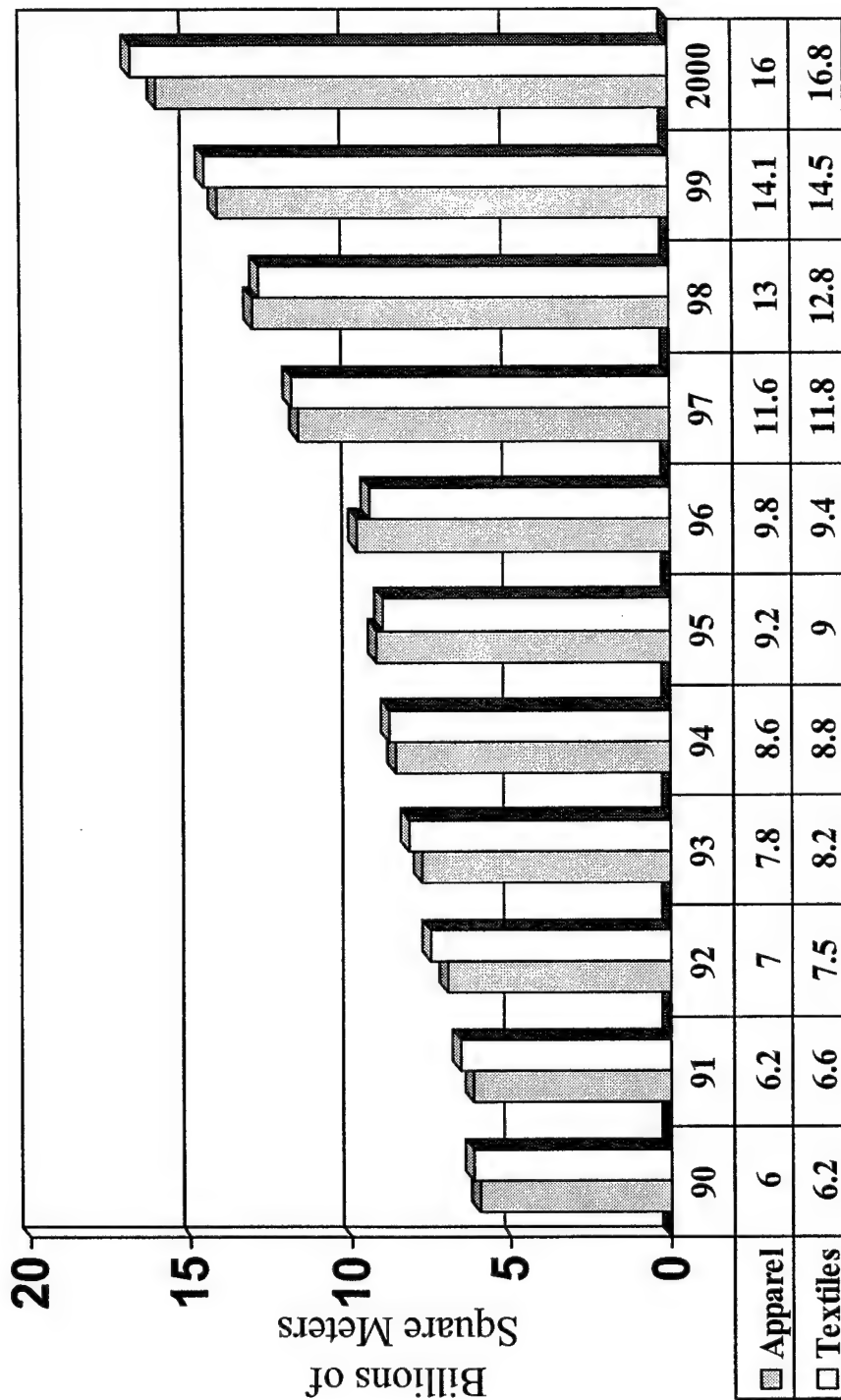
Source: The American Apparel and Footwear Association

Results - Savings

Retail Savings: $34.3 M

MCRD Retail 9/98 - 9/99	$16.6 ⇒ $6.4	$10.2 M
Army Retail 1/00 – 9/00	De-cap Inv.	$18.5 M
MCRD SD 5/00	De-cap Inv.	$ 2.3 M
MCRD PI 12/01	De-cap Inv.	$ 3.3 M

Wholesale Savings: $70.9 M

Marine Share	Baseline-9/01	$36.1 ⇒ $31.1	$ 5.0 M
Army Share	Baseline-9/01	177.3 ⇒ $111.4	$65.9 M

ARN System Architecture

VIM - Virtual Item Manager

1. Viewing 2. Tactical 3. Strategic 4. Balanced Ordering 5. Balanced Wholesale Distribution 6. Retail Distribution 7. Production and Shipping

ARN Asset Visibility System Data Warehouse

Apparel Manufacturers via ASAPweb

Wholesale

- SAMMS
- DoD Legacy systems

- Wholesale Local Systems
  - All five (5) Army RTCs
  - *MCRD at San Diego and Parris Island*

Retail
Site Legacy Systems

VIM-ASAP

AAVS DataMart

Contracts and Requisitions

Incoming Shipments

Process Contracts

Process Requisitions

Update Production Counts

Prepare DD250s and Shipments

Manage Inventories

Prepare DD1348-1As

Digital Invoices

MILSTRIPs & MILSTRAPs

DFAS & DCMA

SAMMS

Requestors and Depots

VIM-ASAP Capabilities

- Receives digital contracts (DD 1155)
- Receives digital requisitions (DD 1348-1A)
- Eliminates all data reentry efforts
- Automatically formats and transmits 40 MILSTRIPs and MILSTRAPs
- Automatically formats and transmits invoices to DFAS via WInS (DCMA uses same data)
- Automatically prepares all bar coded shipping (DD 1387) and container labels
- Automatically translates all DLA codes to English and English to DLA codes
- Exports and imports data from AAVS DataMart to contractor's legacy systems
- Handles follow-up inquiries (some automatically)

ARN System Operational Scenario

RETAIL & WHOLESALE LOCAL

Recruit Training Center (RTC) Item Manager

WHOLESALE

Defense Supply Center Philadelphia (DSCP) C&T Item Manager

MANUFACTURING

Defense Apparel Manufacturer's (DAM) Scheduler

DFAS

(16) WInS FTP Site Invoice (DD250)

VIM/ASAP Track Orders, Cutting, Finished Goods and Shipments (13)

(12) Production Status and Invoice Data

Mfgr's System

(15) Bill & Hold Receipt Processing

(14) DD 250 Packing Slips/Shipments

(11)

BIFRS-W Calculate Rebalance Levels Within Total Supply Chain (10)

VIM/ASAP Support Regional VPVs, Process Requisitions

AAVS DataMart Data Warehouse (6)

Data Daily

Push Delivery Orders

C&T SAMMS
SAMMS Hub
C&T Warehouse

MROs

DSCP Depots (9)

Master Contract Information

Various Transactions (MILSTRIPs & MILSTRAPs)

VIM QLM/Central Replenish & Redistribute (8)

(7)

MRO Directed Shipments

Push Receipts & Accession Data

QLM/ Locals

Inventories, Receipts & Adjustments (5)

Shipments (4)

FTP (push) Issue Transactions (MILSTRIPs)

Push Detailed Scan Data (1)

F I R E W A L L

Recruits scanned using 3D Body Scanner

Size Data (2)

Recruit Issue Data

Service Legacy Systems (3)

ARN Systems

ASTRA — ASAP
QLM Local — DataMart
QLM Central — Body Scan
BIFRS-W — DSCP

ARN Milestones

FY 1995 ARN Contract Awards

FY 1996 Establish ARN Roadmap & Business Case

FY 1997 Teaming with MCRDs for Supply Chain Initiative

FY 1998 Implementations of Retail Inventory Systems at MCRDs

FY 1999 Implementation of WBX Body Scanner at MCRD-SD

FY 2000 Production Roll-out to all (5) Army Recruit Training Centers

DSCP assume ownership and eliminate Army retail inventory

FY 2001 Integration of 3D Scan Data to Supply Chain System at SD

DSCP assume ownership and eliminate Marine retail inventory

FY 2002 Award of ARN II Contracts

APPAREL RESEARCH NETWORK (ARN)
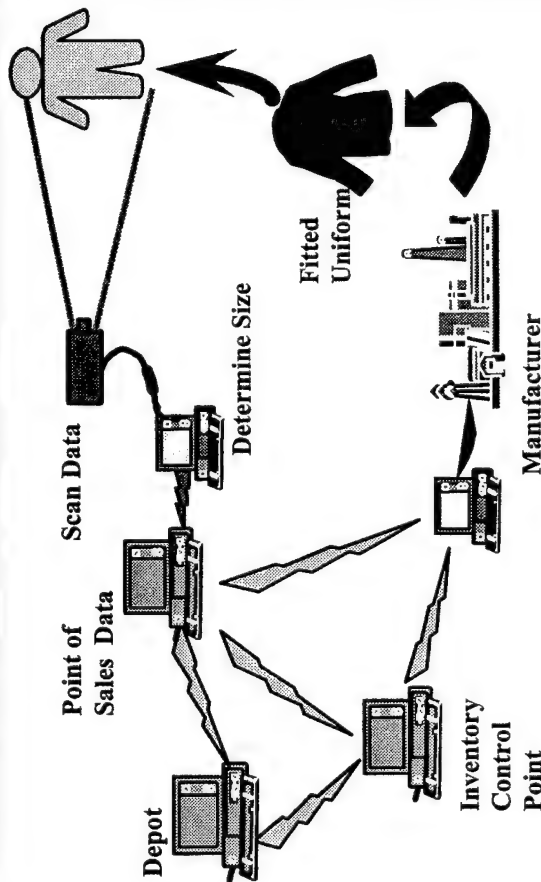
APPROACH

- Develop, demonstrate and implement technologies for the Balanced Inventory Flow Replenishment (BIFR) process in the entire recruit clothing supply chain

- The process starts with 3D full-body scanning for body measurements, size predictions and garment issues. Further integration, planning and shared asset visibility lead to automatic order generation and inventory replenishment while leveling the manufacturing capacity

BENEFITS

- Positive Net Present Value over planning horizon

- $105M retail & wholesale inventory savings achieved for Army and Marine Corps shares.

- Improved service with reduced costs

- Partnership of multiple DoD Organizations and Industry

LEVERAGED EFFORTS

The only program for military apparel items

IMPLEMENTATIONS

- DLA took over retail inventory at all five Army RTCs by FY 01
- DLA took over retail inventory at two Marine RTCs by FY 02
- To include AF and Navy RTCs by FY 03
- Automated wholesale inventory replenishment with total asset visibility is operational at DLA supply center - Philadelphia
- Web based ARN Supply chain Automated Processing (ASAP) for defense manufacturers
- Balanced Inventory Flow testing is underway with manufacturers
- 3-D full body scan database has been populated and will be integrated with the point of sales data and inventory replenishment system
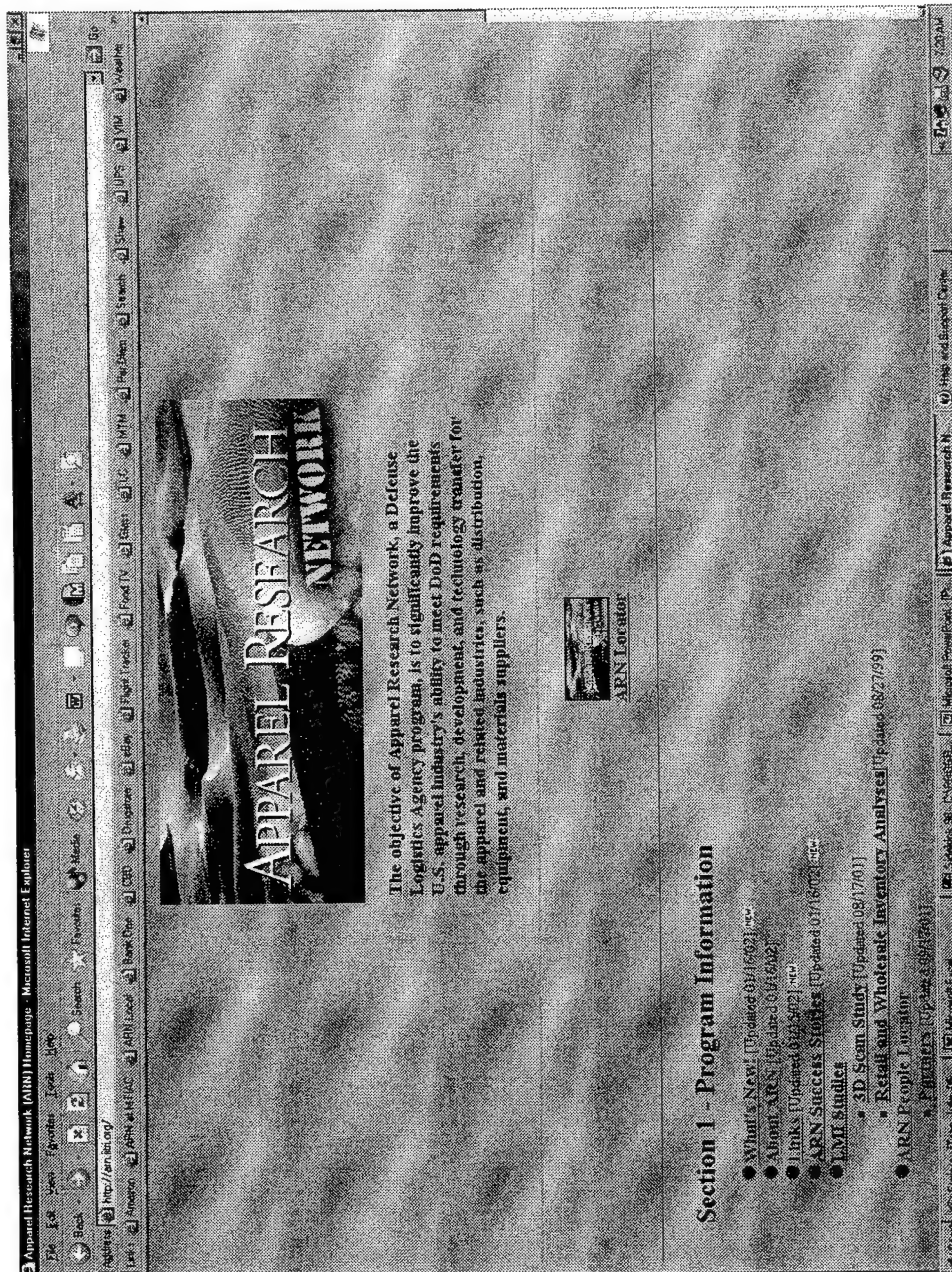

Point of Sales Data — Scan Data — Determine Size — Fitted Uniform — Manufacturer — Inventory Control Point — Depot

GOALS AND METRICS

- Reduce inventory of issued items by 50%
- Reduce lead-time, from requirement to delivery, by 50%

BUSINESS STRATEGY

- Service: Defense Logistics Agency (DLA)

- Monitor: Joint Planning Committee (DLA & Services)

- Performing Organization: 6 Partners include Academia, Industry, Consultant, Equipment Maker

Funding (FY)	02	03	04	05	06	07	08
ManTech ($M)	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Appendix D

ARN Web Site

Michal Safar

13 February 2002

ARN Web

http://arn.iitri.org

ARN Home Page

ARN Home Page

- ARN Program Information
  - What's New
  - About ARN
  - People Locater
  - Working Documents
- ARN Project Information
  - Monthly Progress Reports
  - Final Technical Reports
  - Procedures

ARN Program Information

- What's New
- About ARN
  - BAA
  - Program Presentations
  - Quad Charts
  - Program Write-ups, e.g. Hammer Nomination
- Links
  - DoD Clothing Sites
  - Research Projects

ARN Program Information

- Success Stories
  - Write Ups of Completed Projects
  - Submitted to JDMTP 5-Year Plan
- LMI Studies
  - 3D Scan Study
  - Retail and Wholesale Inventory Analyses

ARN Program Information

- People Locator
  - Partners
  - Meeting Attendance Lists
  - DLA/DSCP
  - Government POCs
  - Program Support
  - ARN System

ARN Program Information

- Working Documents

  - ARN Supply-chain Automated Processing (ASAP)

  - ARN SCR Log - (Userid and Password Required)

  - ARN Workshop Proceedings

  - ARN Meeting Minutes

  - ARN Presentations

  - Supply Chain Management

  - ARN-VIM

  - ASTRA Daily Reports

  - 3-D Body Scan Technologies

  - Other ARN Documents

ARN Project Information

- Interim Progress Reports
  - 3D Scanning
  - Supply Chain Management
  - Clemson Demo
- Final Technical Reports
- Forms and Procedures
  - Government Forms
    - SF 1411 – Contract Pricing Proposal Cover Sheet
    - SF 298 – Report Documentation Page – GSA Web Site
    - SF 1034 – Public Voucher – GSA Web Site
  - Report Formats
    - Monthly Interim Progress Report
    - Final Technical Report
  - Procedures
    - No cost extension
    - Technical Direction
    - Submission of Project Reports